

REMARKS

Claims 1-12, 16-21, 23-25, 27 and 29-39 are pending in this application, with claims 1, 4, 7, 10, 16, 19 and 23 being independent. Claims 13-15, 22, 26 and 28 have been canceled, and claims 1, 19 and 23 have been amended to recite removal of an oxide film that is formed during application of a laser beam, as discussed in the application at, for example, page 32, lines 3-7.

Claims 1-3, 29 and 30 have been rejected as being unpatentable over Funai (U.S. Patent No. 6,162,667) in view of Ghandhi (VLSI Fabrication Principles). Applicant requests reconsideration and withdrawal of this rejection because neither Funai, Ghandhi, nor any proper combination of the two describes or suggests “removing an oxide film formed on a surface of the semiconductor film when applying the laser beam by using a second solution after applying the laser beam,” as recited in claim 1. Recognizing that Funai does not describe cleaning the semiconductor film after applying the laser beam, the rejection relies on general statements in Ghandhi regarding the desirability of cleaning the semiconductor wafer after each step in the fabrication process. However, nothing in Ghandhi would have motivated one of ordinary skill in the art to modify the approach described by Funai so as to remove an oxide film that forms during application of the laser beam. Indeed, while Ghandhi describes, at page 519, removing the upper 50 Angstroms of an oxide layer in order to remove contamination that may result from storage of an oxidized silicon wafer, Ghandhi does not appear to describe or suggest removing the entire oxide layer.

Claims 4-6, 10-12 and 16-18 have been rejected as being unpatentable over Funai in view of Ramesh (U.S. Patent No. 4,795,679). Applicant requests reconsideration and withdrawal of this rejection because neither Funai, Ramesh, nor any proper combination of the two describes or suggests preheating the cleaned surface of the semiconductor film to form an oxide film, as recited in each of independent claims 4, 10 and 16. While Funai describes forming an oxide film 1303, Funai nowhere mentions doing so by preheating the cleaned surface of the semiconductor film. Rather, Funai, at col. 44, lines 63-67, describes forming the oxide film 1303 by immersing the surface of the amorphous silicon film in a mixture of sulfuric acid and a hydrogen peroxide solution. Ramesh similarly fails to describe or suggest preheating the cleaned surface.

Claims 7-9 have been rejected as being unpatentable over Funai in view of Yoneda (U.S. Patent No. 5,648,282) and Ramesh. Applicant requests reconsideration and withdrawal of this rejection because neither Funai, Yoneda, Ramesh, nor any proper combination of the three describes or suggests preheating the cleaned surface of the semiconductor film in an atmosphere containing oxygen and nitrogen to form an oxide film, as recited in claim 7. As discussed above, Funai and Ramesh fail to describe or suggest such preheating.

Moreover, there would have been no motivation to combine Yoneda with Funai and Ramesh in the manner set forth in the rejection. Yoneda describes forming a thin oxide film 117 on the surface of polysilicon layers 106, 107 having a high concentration impurity so as to work as a barrier against external diffusion of the high concentration impurity. To accomplish this, Yoneda introduces a silicon substrate 101 that includes the layers 106, 107 into a furnace at a temperature of 900 C., and lets the temperature stabilize before forming the oxide film 117. By contrast, as discussed above, Funai describes forming an oxide film 1303 by immersing the surface of the amorphous silicon film in a mixture of sulfuric acid and a hydrogen peroxide solution. Nothing in Funai, Yoneda or Ramesh would have motivated one of ordinary skill in the art to replace Funai's process for forming the oxide film 1303 with Yoneda's process for forming the oxide film 117.

Nor does the rejection identify and proper motivation for making the modification set forth in the rejection. In particular, the rejection merely states that it would have been obvious "to perform the heating process in an oxygen and nitrogen atmosphere as taught by Yoneda in the crystalline semiconductor film process of Funai et al., since this would result in the formation of an oxide layer in a purged environment (column 11, line 53 – column 12, line 5)." This statement points to no motivation in either reference for making the change and, instead, appears to be using the claim as a roadmap for combining the references, which is improper.

Claims 19-21, 23-25 and 36-39 have been rejected as being unpatentable over Funai in view of Ramesh, Ghandhi and Asai (U.S. Patent No. 5,365,875). Applicant requests reconsideration and withdrawal of this rejection because neither Funai, Ghandhi, Ramesh, Asai,

nor any proper combination of the four describes or suggests "removing an oxide film formed on a surface of the semiconductor film when applying the laser beam by using a second solution after applying the laser beam," as recited in each of claims 19 and 23. As discussed above with respect to claim 1, neither Funai, Ghandhi, nor any proper combination of the two describes or suggests such removal. Neither Ramesh, which appears to be cited for purposes of reciting a dielectric capping layer, nor Asai, which appears to be cited for purposes of reciting formation of a crystalline semiconductor layer in air, remedies this failure of Funai and Ghandi. Accordingly, the rejection should be withdrawn.

Claim 27, which depends from claim 1, has been rejected as being unpatentable over Funai in view of Ghandhi and Hoga (U.S. Patent No. 4,552,595). Applicant requests reconsideration and withdrawal of this rejection because Hoga does not remedy the failure of Funai and Ghandi to describe or suggest the subject matter of claim 1.

Claims 31 and 35, which depend from claims 4 and 16, have been rejected as being unpatentable over Funai in view of Ghandhi and Hoga (U.S. Patent No. 4,552,595). Applicant requests reconsideration and withdrawal of this rejection because Hoga does not remedy the failure of Funai and Ghandi to describe or suggest the subject matter of claim 1.

Applicant submits that all claims are in condition for allowance.

A check in the amount of \$120.00 for the One-Month Extension of Time is enclosed.
Please apply any additional charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: 6/7/05

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